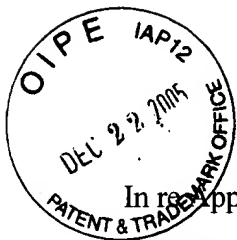


DEC 23 2005



IN THE U.S. PATENT AND TRADEMARK OFFICE

AF  
JW

In re application of: **McDonough**

Docket No.: **TI-31693**

Serial No.: **09/884,585**

Examiner: **J. Torres**

Filed: **June 19, 2001**

Art Unit: **2631**


For: **SYSTEM AND METHOD FOR SHIFTING THE PHASE OF PSEUDORANDOM NOISE CODE IN DIRECT SEQUENCE SPREAD SPECTRUM COMMUNICATIONS**

**APPEAL BRIEF TRANSMITTAL FORM**

December 22, 2005

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

MAILING CERTIFICATE UNDER 37 C.F.R. §1.8(A)  
I hereby certify that the above correspondence is being deposited with the U.S. Postal Service as Express Mail label number ED 891756139 US addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on December 22, 2005.-

  
Robert N. Rountree, Reg. No. 39,347

Dear Sir:

Transmitted herewith in triplicate is Appellants' Brief in the above-identified application.

Charge the fee under 37 C.F.R. § 1.17(c) and any additional fees, or credit overpayment to the deposit account of Texas Instruments Incorporated, Account No. 20-0668. An original and two copies of this sheet are enclosed.

Respectfully submitted,



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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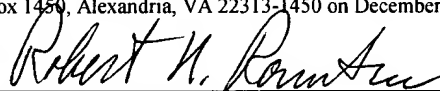
For: **SYSTEM AND METHOD FOR SHIFTING THE PHASE OF PSEUDORANDOM  
NOISE CODE IN DIRECT SEQUENCE SPREAD SPECTRUM COMMUNICATIONS**

**APPELLANTS' BRIEF**

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Box 1450, Alexandria, VA 22313-1450 on December 22, 2005.

  
Robert N. Rountree, Reg. No. 39,347

Dear Sir:

In support of their appeal of the Final Rejection of claims in the above-referenced application, Appellants respectfully submit herein their brief.

**1. REAL PARTY IN INTEREST**

Texas Instruments Incorporated is the real party in interest.

**2. RELATED APPEALS AND INTERFERENCES**

No other related appeals or interferences are known to Appellants.

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### **3. STATUS OF CLAIMS**

Claims 1-2, 4-9, and 11-25 are in the application. Claims 1-2, 4-6, 13 and 15-17 are rejected under 35 U.S.C. § 102(e). Claims 7-9, 11-12, 14, and 18-25 are rejected under 35 U.S.C. § 103(a). Claims 3 and 10 are cancelled without prejudice.

Examiner in an Office Action of June 3, 2005 made final rejection of claims 1-2, 4-9, and 11-25. Examiner reaffirmed the June 3, 2005 rejection in an Advisory Action dated August 15, 2005. Claims 1-2, 4-9, and 11-25 are on appeal and are reproduced in the Appendix to Appellants' Brief filed herewith.

### **4. STATUS OF AMENDMENTS**

No amendment was filed subsequent to final rejection.

### **5. SUMMARY OF CLAIMED SUBJECT MATTER**

A pseudorandom noise (PN) code may have  $2^{42}-1$  states and uniquely identifies a mobile station (Figure 2) in forward and reverse traffic channels in one embodiment of the present invention. (page 3, lines 20-24). A PN code generator (112) may be turned off in a low power mode and must be restarted in a proper state. (page 4, lines 3-9). A phase-shifting mask (102) may be used to initialize the PN code generator to this proper state. (page 4, lines 1-2). Independent claim 1 is directed to a method for shifting the phase of a pseudorandom noise (PN) code. The method includes accepting a PN code with a first phase. (page 18, lines 1-3). A first time interval is determined corresponding to the time the PN generator is in the low power mode. A plurality of phase-shifting masks are selected in response to the first time interval. The PN code first phase is shifted with each phase-shifting mask from the plurality of selected phase-shifting masks. A PN code with a second phase is generated, offset by the first time interval from the PN code first phase. (page 18, lines 7-16).

Independent claim 15 is directed to a receiver as in Figure 2. (page 12, line 11 through page 13, line 2). The receiver comprises a memory (102) having a port (104) to supply a plurality of phase-shifting masks (MASK 1-n). An application means (106) determines a first time interval and cross-references the first time interval to the plurality of phase-shifting masks. The application means has an output (110) connected to the memory port to request the plurality of phase-shifting masks. A pseudorandom noise (PN) code generator (112) has a first input (104) connected to the memory to accept the plurality of phase-shifting masks. The PN code generator offsets a PN code with each phase-shifting mask of the plurality of phase-shifting masks. (page 18, lines 1-6). The PN code generator has an output (148) to supply the PN code with a second phase, offset from the PN code first phase.

Independent claim 25 is directed to a method for conserving power in a slotted mode of operation. (page 1, lines 15-17). Referring to Figure 7, the method includes storing a plurality of phase-shifting masks (200a) and generating a synchronized pseudorandom noise (PN) code (201) to despread transmissions. A slotted mode sleep second time interval is accepted (203) from a plurality of second time intervals. A sleep mode begins at a first phase of the PN code when a chip rate clock is powered off (203a). The sleep interval ends when the chip rate clock is powered on (203b). A first time interval is determined between the beginning and the end of the sleep interval (204). A plurality of phase-shifting masks are selected from storage in response to the first time interval. The PN code first phase is offset with each phase-shifting mask from the plurality of selected phase-shifting masks (page 18, lines 1-6). A PN code is generated with a second phase (210). The generated PN code is resynchronized to despread transmissions (212).

## **6. GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL**

- A.** Claims 1-2, 4-6, 13, and 15-17 are rejected under 35 U.S.C. § 102(e) as being anticipated by Storm et al. (U.S. Pat. No. 6,175,561).
- B.** Claims 25 is rejected under 35 U.S.C. § 103(a) as being unpatentable over by Storm et al. (U.S. Pat. No. 6,175,561) and further in view of Easton et al. (U.S. Pat. No. 6,590,886).

## 7. ARGUMENT

Claim 1 is rejected under 35 U.S.C. § 102(e) as being anticipated by Storm et al. Claim 1 recites “A method for shifting the phase of a pseudorandom noise (PN) code, the method comprising: accepting a PN code with a first phase; determining a first time interval; **selecting a plurality of phase-shifting masks in response to the first time interval; shifting the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks**; and generating a PN code with a second phase, offset by the first time interval from the PN code first phase.” (emphasis added).

Regarding claim 1, in an Advisory Action dated August 15, 2005, Examiner Torres stated “Storm discloses selecting a plurality of phase-shifting masks in response to the first time interval (figure 2 block 214 column 6, lines 44-46 and column 6 lines 58-60).” (page 3). Appellants respectfully submit that Storm et al. **do not disclose** “selecting a plurality of phase-shifting masks in response to the first time interval.” Neither of the passages cited by Examiner Torres disclose the above-recited limitation.

Referring to Figure 6, Storm et al. disclose a real-time linear sequence generator (RT LSG) 206 and a non-real time sequence generator (NRT LSG) 208. (col. 5, lines 31-39). Both the RT LSG 206 and the NRT LSG 208 generate the same sequence. But the RT LSG is incremented by clock divider 220 and is, therefore, substantially slower than the NRT LSG. (col. 6, lines 47-52). Storm et al. specifically disclose “The mask circuit 210 employs a predetermined mask that, when Exclusive-ORed with the contents of the NRT LSG 208, yields the correct state of the PN generator 205 at a predetermined time in the future.” (col. 6, lines 53-56). Storm et al. rely on a single mask from mask register 212 which is loaded into mask circuit 210. The NRT LSG is then successively incremented, Exclusive-ORed with the selected mask and correlated with samples from buffer 202 by correlator 204. This procedure is described in detail at column 8, line 64 through column 9, line 14. Thus, Storm et al. disclose selecting a single mask and incrementing the NRT LSG to achieve the proper PN offset from an initial state stored in register 214. Storm et al. do not disclose

“selecting a plurality of phase-shifting masks in response to the first time interval” as required by claim 1. Thus, claim 1 and depending claims 2, 4-9, and 11-14 are patentable under 35 U.S.C. § 102(e) over Storm et al.

Furthermore, Storm et al. **do not disclose** “shifting the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks” as required by claim 1. In the Advisory Action dated August 15, 2005, Examiner Torres disagreed and stated the following at the last paragraph of page 3 through page 4.

Storm discloses selecting a plurality of phase-shifting masks (correspond to individual phases of the phase space of the pilot signals) in response to the first time (if there are more pilots of interest, at step 522, the initial state of the NRT LSG 208 which was stored in the register 214 is loaded into the NRT LSG 208, resetting the NRT LSG 208 to an initial condition) interval (figure 2, block 214 column 6 lines 44-46 and column 6 lines 58-60). “The masks correspond to individual phases of the phase space of the pilot signals in the communication system 100.”

Appellants were perplexed by this statement and conducted interviews with Examiner Torres and SPE Ghayour on September 12, 2005, and on September 19, 2005, to request clarification. A summary of this interview is dated September 19, 2005. By way of explanation, if each mask corresponds to an individual phase or time, where do Storm et al. disclose selecting a plurality of phase shifting masks that correspond to the first time as required by claim 1? Claim 1 further requires “shifting the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks.” Storm et al. **do not disclose** shifting the first phase with a plurality of masks. Appellants repeatedly asked for clarification in their interview on September 19, 2005, to no avail. Neither Examiner Torres nor SPE Ghayour could identify an anticipatory disclosure by Storm et al. SPE Ghayour stated during the interview that claim 1 did not recite that the plurality of masks must be selected at the same time. He could not explain the relevance of this statement, however, since Storm et al. do not disclose “selecting a plurality of phase-shifting masks in response to the first time interval” either at the same time or at different times.

Appellants respectfully submit that Storm et al. employ a single mask and rely on the sequence of values from the NRT LSG to produce a correlation result. (col. 6, lines 53-56). This is very different from the invention of claim 1. Thus, claim 1 and depending claims 2, 4-9, and 11-14 are patentable under 35 U.S.C. § 102(e) over Storm et al.

Independent claim 15 is rejected under 35 U.S.C. § 102(e) as being anticipated by Storm et al. Claim 15 recites “A receiver, comprising: a memory having a port to supply a plurality of phase-shifting masks; **an application means to determine a first time interval, the application means cross-referencing the first time interval to the plurality of phase-shifting masks**, the application means having an output connected to the memory port to request the plurality of phase-shifting masks; and a pseudorandom noise (PN) code generator having a first input connected to the memory to accept the plurality of phase-shifting masks, **the PN code generator offsetting a PN code with each phase-shifting mask of the plurality of phase-shifting masks**, the PN code generator having an output to supply the PN code with a second phase, offset from the PN code first phase.” (emphasis added).

Regarding claim 15, Storm et al. **do not disclose** “an application means to determine a first time interval, the application means cross-referencing the first time interval to the plurality of phase-shifting masks.” Examiner Torres indicates Figure 2 and column 6, lines 58-60 of Storm et al. as an anticipatory disclosure. Therein, Storm et al. disclose “The masks correspond to individual phases of the phase space of the pilot signals in the communication system 100 (FIG. 1).” Storm et al. specifically disclose that each mask corresponds to an individual phase. There is no teaching or suggestion that a “first time interval” might be cross-referenced to “the plurality of phase-shifting masks” as required by claim 15. Thus, claim 15 and depending claims 16-17 are patentable under 35 U.S.C. § 102(e) over Storm et al.

Furthermore, Storm et al. **do not disclose** “the PN code generator offsetting a PN code with each phase-shifting mask of the plurality of phase-shifting masks” as required by claim 15. Examiner again indicates Figure 2 and column 6, line 56 of Storm et al. as an anticipatory disclosure. There is no suggestion that each phase-shifting mask from the plurality of phase shifting

masks is used to shift the PN code first phase. Storm et al. disclose using a single mask in combination with sequential iterations of the NRT LSG 208. (col. 6, lines 53-56). By way of contrast, the present invention may combine selected masks having different offsets to achieve a specific offset as described at page 15, lines 14-16. For all the foregoing reasons, therefore, claim 15 and depending claims 16-17 are patentable under 35 U.S.C. § 102(e) over Storm et al.

Claim 25 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Storm et al. in view of Easton et al. (U.S. Pat. No. 6,590,886). Claim 25 recites “A method for conserving power in a slotted mode of operation, the method comprising: storing a plurality of phase-shifting masks; generating a synchronized pseudorandom noise (PN) code to despread transmissions; accepting a slotted mode sleep second time interval from a plurality of second time intervals; beginning the sleep mode at a first phase of the PN code; ending the sleep interval; **determining the first time interval between the beginning and the end of the sleep interval; and selecting a plurality of phase-shifting masks from storage in response to the first time interval; offsetting the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks;** generating the PN code with a second phase; and resynchronizing the generated PN code to despread transmissions.” (emphasis added).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (MPEP § 2143). Appellants respectfully submit that examiner has failed to meet the first and third criteria. Moreover, the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the Examiner does not produce a *prima facie* case, the Appellants are under no obligation to submit evidence of nonobviousness. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to



have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). (MPEP § 2142). Examiner has failed to establish a *prima facie* case of obviousness for the following reasons.

1. SUGGESTION OR MOTIVATION TO COMBINE REFERENCES

Examiner Torres states “Storm and Easton are analogous art because they are from the same field of endeavor.” (Office Action dated June 3, 2005, page 19). Appellants respectfully submit that these are Examiner’s words based on improper hindsight and not the disclosure of Storm et al. or Easton et al. Examiner fails to offer any rationale for modifying the disclosure of Storm et al. A statement that modifications of the prior art to meet the claimed invention would have been “well within the ordinary skill of the art at the time the claimed invention was made” because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Here, there is no teaching or suggestion to combine Storm et al. with Easton et al. apart from improper hindsight in view of the instant specification. Thus, claim 25 is patentable under 35 U.S.C. § 103(a).

## 2. ALL CLAIM LIMITATIONS

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Examiner’s proposed combination of Storm et al. with Easton et al. fails to teach or suggest all the claim limitations. Even an improper combination of Storm et al. with Easton et al. **does not disclose** “selecting a plurality of phase-shifting masks from storage in response to the first time interval” as required by claim 25. Storm et al. disclose using a single mask in combination with sequential iterations of the NRT LSG 208. (col. 6, lines 53-56). By way of contrast, the present invention may combine selected masks having different offsets to achieve a specific offset as described at page 15, lines 14-16. Thus, claim 25 is patentable under 35 U.S.C. § 103(a) over Storm et al. in view of Easton et al.

Moreover, an improper combination of Storm et al. with Easton et al. **does not disclose** “offsetting the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks” as required by claim 25. As previously discussed, Storm et al. disclose selecting a single mask and incrementing the NRT LSG to achieve the PN proper offset from an initial state stored in register 214. There is no teaching or suggestion in either reference to offset the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks. Appellants respectfully reiterate, therefore, that claim 25 is patentable under 35 U.S.C. § 103(a) over Storm et al. in view of Easton et al.

Appellants acknowledge the rejections of depending claims 7-9, 11-12, 14, 18-20, and 21-24 under 35 U.S.C. § 103(a) and respectfully submit they are patentable as depending from patentable claims.

In view of the foregoing, Appellants respectfully request favorable consideration of the appeal from Final Rejection in the above referenced application, its reversal, and allowance of claims 1-2, 4-9, and 11-25.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert N. Rountree", written in a cursive style.

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## 8. APPENDIX

### CLAIMS ON APPEAL

1. A method for shifting the phase of a pseudorandom noise (PN) code, the method comprising:
  - accepting a PN code with a first phase;
  - determining a first time interval;
  - selecting a plurality of phase-shifting masks in response to the first time interval;
  - shifting the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks; and
  - generating a PN code with a second phase, offset by the first time interval from the PN code first phase.
2. The method of claim 1 wherein determining a first time interval includes accepting a first time interval from among a plurality of first time intervals.
4. The method of claim 1 further comprising:
  - generating the PN code at a first chip period; and
  - accepting a second time interval proportionally related to the first chip period.
5. The method of claim 4 wherein accepting a second time interval includes accepting a second time interval from among a plurality of second time intervals.
6. The method of claim 5 wherein determining a first time interval from among a plurality of first time intervals includes determining a first time interval from among a plurality of first time intervals that are offset from each other by predetermined periods of time.
7. The method of claim 6 wherein generating the PN code with the first chip period includes generating a PN code with  $(2^N - 1)$  states, and a period  $m$  equal to  $(2^N - 1)$  times the first chip period;

wherein determining a first time interval includes selecting a first time interval in the range between zero and  $m$ , with a resolution of  $x$ ; and

wherein generating a PN code with a second phase, offset a second time interval from the PN code first phase includes generating a PN code with a second phase that is offset with respect to time in units of  $x$ .

8. The method of claim 7 wherein  $x$  is the first chip period.

9. The method of claim 7 wherein  $x$  is equal to the first chip period times  $q$ , where  $q$  is an integer.

11. The method of claim 7 in which a direct sequence spread spectrum (DSSS) receiver with a memory is included, wherein determining a first time interval includes determining a first time interval in the range between  $x$  and  $nx$ ; and the method further comprising:

storing  $n$  phase-shifting masks in memory, corresponding to the plurality of first time periods between  $x$  and  $nx$ ; and

wherein selecting a phase-shifting mask includes selecting a phase-shifting mask from the  $n$  phase-shifting masks stored in memory.

12. The method of claim 7 in which a direct sequence spread spectrum (DSSS) receiver with a memory is included, wherein determining a first time interval includes determining a first time interval from a plurality of first time intervals in the range between  $x$  and  $nx$ ; and the method further comprising:

storing  $\log_2(n)$  phase-shifting masks in memory corresponding to  $\log_2(n)$  intermediate time intervals between  $x$  and  $nx$ ;

summing intermediate first time intervals to form a first time interval sum;

wherein selecting a plurality of phase-shifting masks includes selecting phase-shifting masks from memory corresponding to each of the intermediate time intervals in the first time interval sum; and

wherein shifting the PN code first phase with each phase-shifting mask includes shifting the PN code first phase with the phase-shifting masks selected from memory.

13. The method of claim 1, wherein the plurality of phase-shifting masks are selected from a number of stored phase-shifting masks, and wherein the number of stored phase-shifting masks is adjustable.

14. The method of claim 11 in which the DSSS receiver accepts transmissions spread using the first PN code, and in which the DSSS receiver includes a first chip rate clock; the method further comprising:

- synchronizing the accepted transmissions with the generated PN code;
- following the selecting of a second time interval, powering-off the first chip rate clock during a slotted mode sleep interval;
- powering-on the first chip rate clock; and
- wherein determining the first time interval includes determining the sleep time interval that the first rate clock was powered-off; and the method further comprising:
  - following the generating of the PN code with the second phase, resynchronizing the generated PN code with the accepted transmissions.

15. A receiver, comprising:

- a memory having a port to supply a plurality of phase-shifting masks;
- an application means to determine a first time interval, the application means cross-referencing the first time interval to the plurality of phase-shifting masks, the application means having an output connected to the memory port to request the plurality of phase-shifting masks;
- and

- a pseudorandom noise (PN) code generator having a first input connected to the memory to accept the plurality of phase-shifting masks, the PN code generator offsetting a PN code with each phase-shifting mask of the plurality of phase-shifting masks, the PN code generator having an output to supply the PN code with a second phase, offset from the PN code first phase.

16. The receiver of claim 15 wherein the memory includes a plurality of phase-shifting masks; and

wherein the application means cross-references a plurality of time intervals to the plurality of phase-shifting masks in memory.

17. The receiver of claim 16 wherein the PN code generator generates the PN code at a first chip period;

wherein the application means determines a first time interval proportionally related to the first chip period; and

wherein the memory supplies a phase-shifting mask that is offset by a PN code phase shift proportionally related to the first time interval.

18. The receiver of claim 17 wherein the PN code generator generates the PN code with  $(2^N - 1)$  states, and a period  $m$  equal to  $(2^N - 1)$  times the first chip period;

wherein the application means determines a first time interval from among a plurality of time intervals in the range between zero and  $m$ , with a resolution of  $x$ ; and

wherein the PN code generator generates a PN code with a second phase, offset from the PN code first phase with a phase shift, expressed as time in units of  $x$ .

19. The receiver of claim 18 wherein  $x$  is equal to the first chip period.

20. The receiver of claim 18 further comprising:

a sleep clock having an output connected to the application means with a period of  $q$  times the first chip period, where  $q$  is an integer; and

wherein the application means plurality of time intervals have a resolution of  $x$  equal to the sleep clock period.

21. The receiver of claim 18 wherein the application means includes a plurality of first time intervals in the range between  $x$  and  $nx$ ; and

the memory includes  $n$  phase shift masks corresponding to the plurality of first time periods between  $x$  and  $nx$ .

22. The receiver of claim 18 wherein the application means includes a plurality of time intervals in the range between  $x$  and  $nx$ ;

wherein the application means selects a plurality of  $\log_2(n)$  time intervals to form a first interval sum;

wherein the memory includes  $\log_2(n)$  phase-shifting masks corresponding to  $\log_2(nx)$  intermediate time intervals between  $x$  and  $nx$ ; and

wherein the application means selects a plurality of phase-shifting masks from memory corresponding to a plurality of time intervals in the first time interval sum;

wherein the memory supplies the selected phase-shifting masks to the PN code generator; and

wherein the PN code generator iteratively shifts the PN code first phase with each of the plurality of selected phase-shifting masks to supply the PN code second phase.

23. The receiver of claim 18 in which transmissions are accepted spread with the PN code, and the receiver further comprising:

a first chip rate clock having an output connected to the PN code generator, the first chip rate clock being powered-off at the beginning of the first time period, and being powered-on at the finish of the first time period; and

a searcher section having an input connected to PN code generator output to accept the PN code with the second phase shift, the searcher section resynchronizing the accepted transmissions with the generated PN code, following the power-on of the first chip rate clock.

24. The receiver of claim 23 wherein the application means accepts a second time interval corresponding to a slotted sleep mode interval, wherein the application means programs the PN code generator to be powered off for the second time interval; and

wherein the application means determines the first time interval in response the actual time that the PN code generator was powered-off.



25. A method for conserving power in a slotted mode of operation, the method comprising:
- storing a plurality of phase-shifting masks;
  - generating a synchronized pseudorandom noise (PN) code to despread transmissions;
  - accepting a slotted mode sleep second time interval from a plurality of second time intervals;
  - beginning the sleep mode at a first phase of the PN code;
  - ending the sleep interval;
  - determining the first time interval between the beginning and the end of the sleep interval; and
  - selecting a plurality of phase-shifting masks from storage in response to the first time interval;
  - offsetting the PN code first phase with each phase-shifting mask from the plurality of selected phase-shifting masks;
  - generating the PN code with a second phase; and
  - resynchronizing the generated PN code to despread transmissions.

LEXSEE 227 USPQ 972

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UNITED STATES PATENTS QUARTERLY

Ex parte Clapp

No Number in Original

U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences

227 U.S.P.Q. (BNA) 972

Opinion dated Feb. 28, 1985

**CASE HISTORY and DISPOSITION:** Application for patent of Thomas R. Clapp, Serial No. 257,162, filed Apr. 24, 1981. From rejection of Claim 9-19, applicant appeals (Appeal No. 553-54). Reversed.

**HEADNOTES:**  
**PATENTS**

[\*\*1H] 1. Anticipation -- Combining references (51.205)

To support conclusion that claimed combination is directed to obvious subject matter, references must either expressly or impliedly suggest claimed combination or examiner must present convincing line of reasoning as to why artisan would have found claimed invention to have been obvious in light of references' teachings.

**CLASS-NO:** 51.205

**COUNSEL:** Gomer W. Walters, for appellant.

**JUDGES:** Before Bennett, Henon and Spencer, Examiners-in-Chief.

**OPINIONBY:** Henon, Examiner-in-Chief.

**OPINION:**

This appeal is from the decision of the examiner rejecting claims 9 through 19, which constitute all the claims remaining in the application.

The invention relates to an auger type mixing apparatus for mixing cementitious materials employing a volatile liquid. Representative claim 9 reads as follows:

9. Apparatus mounted on a vehicle for mixing a cementitious material in which a volatile liquid is employed comprising:  
an enclosed mixing chamber sealed to prevent the escape of the volatile liquid and any potentially dangerous fumes;  
a solid frame forming the top of said mixing chamber and having an inlet end thereof pivotably mounted on the vehicle;

an easily removable elastomeric trough forming the bottom of said mixing chamber, the elastomeric material selected to be compatible with the materials being mixed;

an auger having a central shaft and mounted in said frame to convey materials through said mixing chamber;

mixing paddles mounted on the shaft of said auger;

a drive motor for said auger mounted on said frame;

a releasable flexible coupling between the aligned shafts of said motor and said auger to permit removal of said auger from said frame;

an inlet hopper to introduce substantially dry materials into said mixing chamber;

liquid injection means to introduce a liquid into said mixing chamber at a distance removed from said inlet hopper to have said substantially dry material form a plug to prevent the liquid and any fumes from backing up said inlet hopper; and

a discharge opening formed in said elastomeric trough.

The references relied on by the examiner are:

Clemens 2,159,205 May 23, 1939

August 2,709,075 May 24, 1955

Tiemersma 3,199,145 Aug. 10, 1965

Cunningham 3,227,424 Jan. 4, 1966

Zimmerman 3,310,293 Mar. 21, 1967

Futty et al. (Futty) 3,339,898 Sep. 5, 1967

Wilkinson et al. (Wilkinson) 3,348,820 Oct. 24, 1967

Lasar 3,901,483 Aug. 26, 1975

Claims 9 through 14 and 17 stand rejected as being directed to obvious subject matter within the meaning of 35 U.S.C. 103 in light of the teachings of Zimmerman in view of Wilkinson, Futty, Lasar, Clemens and Cunningham. The examiner contends that Zimmerman discloses the claimed subject matter except for "having the mixing chamber enclosed with a solid top frame and having a removable auger and having liquid injection means and aligned shafts between the motor and auger and a discharge formed in the elastomeric trough," (final rejection, page 2, paper number 5). The examiner cites Wilkinson as disclosing an enclosed mixing chamber [\*973] where the enclosure comprises an inverted substantially U-shaped top frame portion and concludes that it therefore would be obvious to the artisan to modify the open frame in Zimmerman to be an enclosed mixing chamber as taught by Wilkinson "if desired." Since Wilkinson also discloses the concept of providing liquid injection means for the introduction of liquid into a mixing chamber remote from the inlet hopper, the examiner concludes that it would therefore be obvious to modify Zimmerman accordingly. Since Lasar discloses the concept of having an auger with mixing paddles mounted thereon wherein the auger is releasably coupled to a frame, the examiner concludes that it would have been obvious to the artisan to modify the auger in Zimmerman as taught by Lasar. Futty is cited to show that it is well known to provide coaxial alignment between an auger shaft and the shaft of a driving motor. Clemens is cited as disclosing the concept of having a discharge opening in a trough. The examiner concludes that it would have been obvious in light of Futty and Clemens to modify the auger motor alignment and discharge opening of Zimmerman to be of the nature suggested by Futty and Clemens. Cunningham is cited as disclosing seal means to preclude leakage of the material within the mixing chamber. The examiner concludes that it would have been obvious in light of the teachings of Cunningham to employ seal means on the modified device of Zimmerman.

Claim 15 stands rejected as being directed to obvious subject matter under 35 U.S.C. 103 in light of the combined teachings of Zimmerman, Wilkinson, Futty, Lasar, Clemens, Cunningham and August. Combining the teachings of Zimmerman, Wilkinson, Futty, Lasar, Clemens and Cunningham in the manner specified supra, the examiner concludes that it would have been further obvious to the artisan in light of the teachings of August to provide spray elements with selectively activated controls since August teaches such devices to be known.

Claims 16, 18 and 19 stand rejected as being directed to obvious subject matter under 35 U.S.C. 103 in light of the combined teachings of Zimmerman, Wilkinson, Fatty, Lasar, Clemens, Cunningham and Tiemersma. Combining the teachings of Zimmerman, Wilkinson, Fatty, Lasar, Clemens and Cunningham in the manner specified supra, the examiner concludes that it would have been obvious to further modify the structure of Zimmerman to include a gas-filled bearing housing for sealing purposes.

Rather than reiterate the arguments of appellant and the examiner, reference is made to the brief and answer for the respective details thereof.

Opinion We will not sustain any of the rejections.

Go to Headnotes [\*\*1R] [1] Presuming arguendo that the references show the elements or concepts urged by the examiner, the examiner has presented no line of reasoning, and we know of none, as to why the artisan viewing only the collective teachings of the references would have found it obvious to selectively pick and choose various elements and/or concepts from the several references relied on to arrive at the claimed invention. In the instant application, the examiner has done little more than cite references to show that one or more elements or subcombinations thereof, when each is viewed in a vacuum, is known. The claimed invention, however, is clearly directed to a combination of elements. That is to say, appellant does not claim that he has invented one or more new elements but has presented claims to a new combination of elements. To support the conclusion that the claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. We find nothing in the references that would expressly or impliedly teach or suggest the modifications urged by the examiner. Additionally, as aforementioned, we find no line of reasoning in the answer, and we know of none, as to why the artisan would have found the modifications urged by the examiner to have been obvious. Based upon the record before us, we are convinced that the artisan would not have found it obvious to selectively pick and choose elements or concepts from the various references so as to arrive at the claimed invention without using the claims as a guide. It is to be noted that simplicity and hindsight are not proper criteria for resolving the issue of obviousness. Note *In re Horn*, 203 USPQ 969, 971 (CCPA 1979). Accordingly, we will not sustain any of the rejections presented.

The decision of the examiner rejecting claims 9 through 19 as being directed to obvious subject matter within the meaning of 35 U.S.C. 103 is reversed.

LEXSEE 217 F.3D 1365

IN RE WERNER KOTZAB

99-1231

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

217 F.3d 1365; 2000 U.S. App. LEXIS 15504; 55 U.S.P.Q.2D (BNA) 1313

June 30, 2000, Decided

**PRIOR HISTORY:** [\*\*1] Appealed from: U.S. Patent and Trademark Office Board of Patent Appeals and Interferences. (Reexamination No. 90/004,441).

**DISPOSITION:** REVERSED.

**LexisNexis(R) Headnotes**

**COUNSEL:** Robert F. I. Conte, Lee, Mann, Smith, McWilliams, Sweeney & Ohlson, of Chicago, Illinois, argued for appellant. Of counsel were Thomas Eugene Smith and James B. Conte.

Mark Nagumo, Associate Solicitor, U.S. Patent and Trademark Office, of Arlington, Virginia, argued for the appellee. With him on the brief were Albin F. Drost, Acting Solicitor, John M. Whealan, Acting Deputy Solicitor, and Stephen Walsh, Associate Solicitor.

**JUDGES:** Before LOURIE, GAJARSA, and LINN, Circuit Judges.

**OPINIONBY:** LINN

**OPINION:** [\*1367] LINN, Circuit Judge.

DECISION

Werner Kotzab appeals from the final decision of the Board of Patent Appeals and Interferences ("Board") holding claims 1-10 in reexamination number 90/004,441 unpatentable for obviousness under 35 U.S.C. § 103(a). See *Ex Parte Kotzab*, Paper No. 17 (BPAI July 15, 1998). This case was submitted for our decision following oral argument on April 4, 2000. Because certain of the Board's key factual findings relating to its obviousness analysis are not supported by substantial evidence, and [\*\*2]

because the Board erred in concluding that the claims would have been obvious as a matter of law, we reverse.

#### BACKGROUND

##### A. The Invention

The invention involves an injection molding method for forming plastic articles. In such methods, the temperature of the mold must be controlled so that the plastic can harden uniformly throughout the mold. Kotzab was confronted with the problem of providing optimal temperature control for an injection molding method to ensure the quality of the final product on the one hand, and achieving optimally short molding cycle times on the other hand. He arrived at a solution which is embodied in claim 1 of the reexamination as follows:

1. An improved method of controlling the temperature of an injection mold by pressure feeding molding material into a mold recess of an injection mold by an extruder, curing the material in the mold, and removing molded material from the mold, said pressure feeding, curing, and removing being a molding cycle of recurring molding cycles and said recurring molding cycles having at least a first molding cycle and a second molding cycle,

comparing a preset nominal temperature to an actual temperature measured [\*\*3] by at least one temperature sensor during said first molding cycle and said second molding cycle and supplying an amount of a temperature controlling medium to the first molding cycle and the second molding cycle, said amount of temperature

controlling medium being dependent on the deviation between the actual temperature measured and the desired preset nominal temperature, the improvement comprising:

controlling, via a single sensor, a plurality of flow control valves for the temperature [\*1368] controlling medium to provide impulse temperature control medium to the first and second molding cycles,

determining empirically or by calculation a quantitative spacial distribution of temperature controlling medium needed to obtain said desired preset nominal temperature during at least the first molding cycle and the second molding cycle and determining empirically or by calculation the conduits needed to be utilized to obtain the desired preset nominal temperature during at least the first molding cycle and the second molding cycle,

comparing said desired preset nominal temperature to said actual temperature, at least once during the first molding cycle and the second molding cycle [\*\*4] at a certain point in time being the same for each said molding cycle, such that said comparison made during said first cycle is synchronized with said comparison made during said second subsequent molding cycle, and said plurality of flow control valves are triggered during each said cycle to provide said impulse control medium, and said triggering being dependent on the deviation of temperature determined for each said comparison and also being dependent on a stored profile of said quantitative spacial distribution of the temperature controlling medium.

J.A. at 18-19.

Claim 3, which depends from claim 1, adds the following further limitation: "wherein a flow measuring turbine is associated with each flow control valve to detect the actual flow in each cycle and wherein a proportioning of a cooling or heating medium is effected in dependence on a comparison of a nominal flow to the actual flow." Id. at 19.

Claim 10, which depends from claim 3, additionally provides that "the rotation of said measuring turbine is

transferred into pulses, so that the nominal flow [of the temperature controlling medium] can be fixed by the presetting of a corresponding number of pulses." [\*\*5] Id. at 20.

#### B. The Reexamination Proceeding

U.S. Patent 5,427,720 ("the '720 patent") issued to Kotzab on June 27, 1995. A third party filed a request for reexamination on November 4, 1996. The reexamination was granted and assigned control no. 90/004,441. The amended claims were finally rejected by the Examiner, and Kotzab appealed the rejections to the Board. On July 15, 1998, the Board affirmed the Examiner's rejection of the claims for essentially the reasons expressed in the Examiner's Answer. The Board did, however, provide its own additional comments primarily for emphasis.

Specifically, the Board agreed with the Examiner that WO 92/08598 ("Evans") discloses a process of controlling the temperature of an injection mold by using a sensor to control the pulsing of a temperature control medium through the mold. Moreover, the Board found, as explained by the Examiner, that Evans discloses in a less preferred embodiment, using only one temperature measurement to control the coolant pulses rather than an average temperature measurement. See Evans application, p.6, ll. 17-23.

In addition, the Board found that Evans discloses that "the optimum timing of the cooling flow [\*\*6] can be selected in accordance with the known temperature of the mould." Id. at ll. 6-8. Furthermore, the Board found that a prior art promotional article discloses that manipulation of the geometry and layout of the cooling segment provides for the greatest improvement in molding cycle. See Horst Wieder, Understanding the pulse modulated mold temperature control method, (CITO Products, Inc., WI.) 1987, at p. 1, col. 2, ll. 13-16. And, the Board determined that a May 1984 prior art article indicates that it was known to establish a cooling regime before the mold is produced, and that the determination of the cooling regime includes the number and location of the cooling conduits, as well as the volume of the coolant flow. Thus, the Board concluded that the evidence of record indicates that it [\*1369] was known in the art to utilize empirical data to design the mold and the distribution of cooling channels in that mold. In view of the foregoing, the Board found that the empirical determination of the necessary spacial distribution of the length of the cooling pulses needed for delivering the appropriate coolant is disclosed by Evans or was known at the time the invention was made. [\*\*7] Consequently, the Board affirmed the Examiner's rejection of claims 1, 2, and 4-9 under 35 U.S.C. § 103(a) as being unpatentable over Evans.

The Board made additional findings related to claims 3 and 10 in determining that they were also unpatentable

under 35 U.S.C. § 103(a) over Evans in view of certain secondary references.

Kotzab filed a request for reconsideration, which the Board denied on November 24, 1998. In that decision, the Board reiterated agreement with the Examiner that it would have been obvious for one of ordinary skill in the art to utilize only one temperature measurement to control the coolant pulses in light of the Evans disclosure. Kotzab timely appealed the Board's decision to this court. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A) (1994).

## DISCUSSION

### A. Standard of Review

A claimed invention is unpatentable if the differences between it and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. See 35 U.S.C. § 103(a) (Supp. III 1997); *In re Dembiczak*, 175 F.3d 994, 998, 50 U.S.P.Q.2D (BNA) 1614, 1616 (Fed. Cir. 1999). [\*\*8] The ultimate determination of whether an invention would have been obvious under 35 U.S.C. § 103(a) is a legal conclusion based on underlying findings of fact. See *Dembiczak*, 175 F.3d at 998, 50 U.S.P.Q.2D (BNA) at 1616. We review the Board's ultimate determination of obviousness de novo. See *id.* However, we review the Board's underlying factual findings for substantial evidence. See *In re Gartside*, 203 F.3d 1305, 1316, 53 U.S.P.Q.2D (BNA) 1769, 1776 (Fed. Cir. 2000).

Substantial evidence is something less than the weight of the evidence but more than a mere scintilla of evidence. See *id.* at 1312, 53 U.S.P.Q.2D (BNA) at 1773 (quoting *Consolidated Edison Co. v. NLRB*, 305 U.S. 197, 229-30, 83 L. Ed. 126, 59 S. Ct. 206 (1938)). In reviewing the record for substantial evidence, we must take into account evidence that both justifies and detracts from the factual determinations. See *id.* (citing *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 487-88, 95 L. Ed. 456, 71 S. Ct. 456 (1951)). We note that the possibility of drawing two inconsistent conclusions from the evidence does not prevent the Board's findings [\*\*9] from being supported by substantial evidence. See *id.* Indeed, if a reasonable mind might accept the evidence as adequate to support the factual conclusions drawn by the Board, then we must uphold the Board's determination. See *id.*

### B. Analysis

A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See *Dembiczak*, 175 F.3d at 999, 50 U.S.P.Q.2D (BNA) at

1617. Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." *Id.* (quoting *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. (BNA) 303, 313 (Fed. Cir. 1983)).

Most if not all inventions arise from a combination of old elements. See *In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2D (BNA) 1453, 1457 (Fed. Cir. 1998). Thus, [\*1370] every [\*\*10] element of a claimed invention may often be found in the prior art. See *id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See *id.* Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant. See *In re Dance*, 160 F.3d 1339, 1343, 48 U.S.P.Q.2D (BNA) 1635, 1637 (Fed. Cir. 1998); *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. (BNA) 1125, 1127 (Fed. Cir. 1984). Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference. See *B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582, 37 U.S.P.Q.2D (BNA) 1314, 1318 (Fed. Cir. 1996).

The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. See *Dembiczak*, 175 F.3d at 999, 50 U.S.P.Q.2D (BNA) at 1617. [\*\*11] In addition, the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. See *WMS Gaming, Inc. v. International Game Tech.*, 184 F.3d 1339, 1355, 51 U.S.P.Q.2D (BNA) 1385, 1397 (Fed. Cir. 1999). The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 425, 208 U.S.P.Q. (BNA) 871, 881 (CCPA 1981) (and cases cited therein). Whether the Board relies on an express or an implicit showing, it must provide particular findings related thereto. See *Dembiczak*, 175 F.3d at 999, 50 U.S.P.Q.2D (BNA) at 1617. Broad conclusory statements standing alone are not "evidence." *Id.*

Kotzab's primary argument that the Board erred in holding claims 1-10 unpatentable under 35 U.S.C. § 103(a) over Evans, or Evans in view of secondary references, is that Evans does not teach or suggest the use

of a single temperature sensor to control a plurality of flow control valves. We agree.

As noted previously, [\*\*12] the Board adopted the Examiner's reasoning in upholding the rejection of the claims and added further comments. None of the Board's comments relate to the issue of Evans teaching or suggesting the use of one sensor to control a number of valves regulating coolant flow to the mold. Thus, we look to the Examiner's reasons for finding this limitation to be expressly taught or suggested in Evans.

The Examiner cites Evans for teaching that "one system constructed and operated according to the invention may be used to control a number of valves." Evans application, p. 19, ll. 6-8 (emphasis added). In view of this disclosure only, the Examiner concluded that Evans teaches the use of one sensor to control a number of valves. This conclusion must necessarily rest on the unstated premise by the Examiner that "one system" is equal to "one sensor."

But the Board's decision, adopting the Examiner's premise, lacks the necessary substantial evidence to support a rejection of Kotzab's claims. Specifically, there is not substantial evidence to show that "one system" is the same thing as "one sensor." The words "sensor" and "probe" are used throughout Evans to refer to the device that [\*\*13] measures the mold temperature. Evans uses the word "signal" to refer to the response generated by the measured temperature that controls the valves for coolant flow. Finally, the word "system" is used in Evans to refer to the overall temperature control system that is responsible for the valve timing for coolant flow to increase or decrease the temperature of the mold. Evans clearly never uses the term "system" as a substitute for the simple temperature measuring device it calls "sensor." And, the Board made no reference to any evidence in the record that [\*1371] would equate "one system" with "one sensor."

As mentioned previously, more than a mere scintilla of evidence is necessary to support the Board's implicit conclusion that "one system" is equal to "one sensor." Based on the entirety of Evans' disclosure, we cannot say that there is such relevant evidence as a reasonable mind might accept as adequate to support the conclusion that "one system" means "one sensor."

The United States Patent and Trademark Office argues that because Evans teaches that a single sensor may be used to provide "the temperature measurement at a selected part of the machine," it necessarily follows that the Evans [\*\*14] "system" discussed later may have a single sensor--and that single sensor may control more than one valve. See *id.* at p. 6, ll. 21-23; p. 19, ll. 6-8. While the test for establishing an implicit teaching, motivation, or suggestion is what the combination of these

two statements of Evans would have suggested to those of ordinary skill in the art, the two statements cannot be viewed in the abstract. Rather, they must be considered in the context of the teaching of the entire reference. Further, a rejection cannot be predicated on the mere identification in Evans of individual components of claimed limitations. Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.

We do not take issue with the argument that Evans suggests the concept of using the historic temperature obtained by one temperature measurement to control coolant pulses. See *id.* at p. 5, ll. 14-22; p. 6, ll. 17-23. However, there is not substantial evidence of record to extrapolate this teaching to the multiple zone system described later in Evans. See *id.* at p. 18, l. [\*\*15] 22 to p. 19, l. 8. In the multiple zone system, Evans describes the use of a temperature sensor and an associated flow control valve in each zone. At most, the combined teachings suggest that the historic temperature of a mold zone may be measured by one sensor, and as part of a multiple zone system where multiple valves are controlled, that one sensor measurement can be used to control the valve for that zone. Thus, we cannot say that there is such relevant evidence as a reasonable mind might accept as adequate to support the conclusion that where there are a plurality of control valves in a multiple zone setting, only one temperature sensor provides the control for a plurality of valves.

Moreover, we cannot say that there is such relevant evidence as a reasonable mind might accept as adequate to support implicitly the conclusion that a skilled artisan confronted with (1) the problem noted by Kotzab, i.e., providing optimal temperature control for an injection molding method to ensure the quality of the final product on the one hand, and achieving optimally short molding cycle times on the other hand, and (2) the two statements in Evans, would have been motivated to control a plurality [\*\*16] of valves in a multiple zone setting with only one temperature sensor.

In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab's invention to make the combination in the manner claimed. In light of our holding of the absence of a motivation to combine the teachings in Evans, we [\*1372] conclude



that the Board did not make out a proper prima facie case of obviousness in rejecting claims 1, 2, and 4-9 under 35 U.S.C. § 103(a) over Evans. Moreover, because the rejections of claims 3 and 10 rely upon the foregoing, we also conclude that the Board did not make out a proper prima facie case of obviousness in rejecting those claims under 35 U.S.C. § 103 [\*\*17] (a).

#### CONCLUSION

For the above reasons, we conclude that there is not substantial evidence to support the Board's finding of fact that Evans expressly teaches that "one sensor" may be used to control a plurality of valves, and there is not substantial evidence of record, either expressly or implicitly, to modify the teachings of Evans to obtain a system in which one sensor controls a plurality of valves. Accordingly, we

REVERSE.

LEXSEE 490 F.2D 981

**IN THE MATTER OF THE APPLICATION OF STEPHEN F. ROYKA AND  
ROBERT G. MARTIN**

**Patent Appeal No. 9092**

**UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS**

**490 F.2d 981; 1974 CCPA LEXIS 200; 180 U.S.P.Q. (BNA) 580**

**February 7, 1974, Decided.**

**PRIOR HISTORY:** [\*\*1] Serial No. 648,701.

**LexisNexis(R) Headnotes**

**OPINIONBY:**

**RICH**

**OPINION:** [\*981]

**RICH, Judge.**

This appeal is from the decision of the Patent Office Board of Appeals affirming the examiner's rejection of claims 28 and 30-36 of application serial No. 648,701, filed June 26, 1967, entitled "Responsive Answer System." We reverse.

**The Invention**

The appealed claims are directed to a device in the nature of an answer sheet for use in self-instruction and testing. The answer sheet may be associated with questions or separate therefrom. the essential features of the invention are that there are printed on the answer sheet in "response areas" meaningful information in permanent printing and confusing information in printing which can be removed, as by an eraser, both being legible so that a student, seeing a choice of answers to a question, must make a selection. Having made a selection, he then applies as eraser to the selected response area and some of the information will be readily removed. What remains

advises him of the correctness or otherwise of his answer. The following figures from the drawings are illustrative:

[Graphic omitted. See illustration in original.]

Fig. 1A shows two response areas [\*\*2] to a given question before any removing action [\*982] by the student has taken place and Fig. 1B shows the permanent information remaining in each after erasure of the removable information. Of course, if the student makes an initial choice of area A, showing up "YES" or some other indication of a correct answer, he will not need to proceed further and erase the B area. In a modified form of the invention, a wrong selection, plus erasure, may expose, instead of or in addition to a statement that the answer is wrong, a number or other reference to further material which is to be studied.

A preferred method of printing the permanent meaningful information and the removable confusing information is by that type of xerography in which a fusible toner is used, the permanence of the printing depending on the extent to which the toner image is "fixed" or fused by heat. By successive printings of the two kinds of information with fixing to different degrees, one image can be made permanent and the other made subject to easy removal, both images retaining such similarity of appearance that the user of the answer sheet cannot tell them apart.

Claim 28 is the principal claim, all [\*\*3] others being dependent thereon, and reads as follows:

28. A device for selectively indicating information comprising

a support having response areas for presenting information for selection,

permanent printing indicative of meaningful information permanently fixed to said support within a response area, and

removable printing indicative of confusing information removably fixed to said support within a response area,

said meaningful and confusing information being substantially legible even when said permanent and removable printing are fixed over one another on said support,

said permanent and removable printing being substantially similar such that an observer cannot determine which information is permanent and which is removable

whereby the information within a response area is selected by attempting to remove the printing therein with the failure to remove printing identifying meaningful information.

Claims 30-36 add limitations which need not be considered except for noting that claims 33 and 34 alone specify the use of a xerographic toner, for which reason they were rejected on a different ground from the other claims.

#### The Rejection

The following references [\*\*4] were relied on:

[SEE TABLE IN ORIGINAL]

Claims 28, 30, 31, and 32 were rejected as anticipated under 35 USC 102 by Bernstein; claims 28, 31, 32, 35, and 36 were rejected as anticipated under § 102 by Reid; and claims 33 and 34 were rejected under 35 USC 103 for obviousness, on either Bernstein or Reid in view of Lein. These were the examiner's rejections and the board affirmed them, adhering to its decision on reconsideration.

Bernstein discloses an answer sheet in which printed information representing a response is "temporarily concealed from the observer" and he discloses a number of different ways of effectively concealing the response. His specification states:

The objects of the invention are accomplished by utilizing the hiding media to confuse the participant and to render the response and the hiding media indistinguishable and thus conceal the presence, absence, nature or position of the response from the participant.

This may be effectuated by careful attention being paid to a number of factors including the design, [\*983] color and position of the hiding or confusing media.

Fig. 1 of Bernstein's drawings illustrates some of his concealing means: [\*\*5]

[Graphic omitted. See illustration in original.]

The following is the written description:

Referring now to the drawing, FIG. 1 illustrates some of the many optically confusing patterns which may be positioned between the printed structure to be concealed and the point of observation. Column 11 shows the information which is to be concealed. This information is repeated in columns 12 through 16 but in each case is concealed by a pattern in accordance with the present invention. Column 12 utilizes a pattern comprising an alphabetical maze in both line and half tone screen. Column 13 utilizes a pattern comprising an absorbing field having a plurality of irregular dot-like interstices. Column 14 utilizes a pattern comprising a maze of plus signs combined with dots. Columns 15 and 16 illustrate irregular and non-repetitious patterns. Bernstein says that if at least 50% of the response is actually covered by the opaque portions of the confusion pattern, complete concealment is obtained. He also says that added means of concealment may be used, such as scoring and embossing and perforating the paper in order to scatter the light or let it shine through.

Reid is entitled [\*\*6] "Transformation Picture and Print." The invention is said to be useful for advertisements, Christmas cards, birthday cards, valentines, and the like and as a source of amusement and instruction for children. It consists of a picture or print, part of which is permanently printed and part of which is removable from the paper on which it is printed. For the latter various soluble undercoatings or inks are described. If the picture is washed with a solvent, which may be water, the removable part disappears and the pictorial and/or typographic matter changes. The invention is illustrated by a typical nineteenth century temperance propaganda piece depicting the evils of drink. In the finished picture there are three scenes from left to right: Scene 1, the innocent child leads her father home from the pub; Scene 2, Father sits slumped in the kitchen chair with his bottle beside him, the family wash hanging above his head, this picture being entitled "The Effects of Drink"; Scene 3, Mother stands in front of a sign reading "Pawn Shop." Across the bottom of the picture is a legend which says "Wash the above and see what water will do." Fig. 11 shows the result of washing with water: Scene [\*\*7] 1, a handsome young man and his happy daughter stroll on the street; Scene 2, Father sits erect in a well-appointed room at a cloth-covered table, apparently having a cup of tea, obviously a gentleman; Scene 3, Mother beams from the

sideline and the Pawn Shop sign has vanished. Two new subscriptions appear and the words "The" and "Drink" have disappeared, the resultant being a new picture title reading "The Beneficial Effects of Temperance." "The Beneficial" and "Temperance" were covered by some soluble opaque in the original picture. No doubt the overall effect is instruction. Perhaps there was amusement in bringing about the transformation.

Lein relates to xerography and is relied on only for its disclosure of the removability of partially fused toner and the permanence of fully fused toner.

#### OPINION

As to the § 102 anticipation rejections, it will suffice to consider independent claim 28. If it is not fully met by Reid [\*984] or Bernstein, neither are the more limited dependent claims. It is elementary that to support an anticipation rejection, all elements of the claim must be found in the reference. We do not find claim 28 anticipated by Bernstein because, as [\*\*8] we read the claim, it requires the display of legible meaningful and legible confusing information simultaneously, between which the user of the device may make a selection before he undertakes to remove any of the information from the response area selected by him. The element we find most clearly missing, contrary to the reasoning of the examiner and the board, is the legible confusing information. The Patent Office proposes to read this limitation on Bernstein's confusion patterns which are nothing but meaningless obscuring screens, conveying no information and providing the user with no basis for making a selection, as called for by claim 28. In appellants' device the legible confusing information - i.e., the wrong answers - are legible in the sense that they can be read as intelligible words, not merely a jumble of type serving to obscure the words of the wrong answers.

Appellants were fully aware of Bernstein and discussed its disclosures in their specification, distinguishing from this and other prior art, saying, in part:

The inventive concept hereof confuses not by physical blocking as taught by the prior art, but by compounding, associating (including disarranging) [\*\*9] permanent information with confusing information, usually at least some of which is similar in character to the permanent information as to render it impossible to tell which is permanent and which is removable confusing information. In the invention, generally no attempt is made to designedly physically cover the permanent information, but to confuse it beyond interpretation by the presentation of extraneous removable, confusing information.

Claims are not to be read in a vacuum and while it is true they are to be given the broadest reasonable interpretation during prosecution, their terms still have to be given the meaning called for by the specification of which they form a part. We cannot read the terms "legible" and "information" on Bernstein's confusion patterns, as did the examiner and the board. They are not "legible," as appellants use the term, and they convey no information.

As to anticipation by Reid, we find neither appellants' basic concept nor the substance of claim 28 to be disclosed. Apparently the solicitor could find little to support the rejection in Reid for all he says in his brief - so far as claim 28 is concerned - is:

Reid discloses a sheet which may [\*\*10] be used for instruction and which may have a removable design partly covering a fixed design \* \* \*. Therefore, the disclosure of the reference encompasses the arrangement wherein a removable design covers a fixed design with both designs being substantially legible.

But claim 28 does not call for an arrangement wherein a removable design covers a fixed design. It calls for response areas, which Reid does not have, containing meaningful information in permanent printing together with removable printing conveying confusing information, both legible at the same time, between which a "selection" can be made. The only choice offered to the user by Reid is to follow the instruction to wash the whole visible picture with water or other solvent, thus removing the over-printing, to discover what the permanent picture is. The Patent Office attempt to read claim 28 on this reference is a tour de force. We hold that Reid does not anticipate for failure to meet the limitations of claim 28 to "response areas," to the presentation of two categories of information (meaningful-permanent and removable-confusing) within such areas, and the possibility of selection. Anticipation requires a finding [\*\*11] that the claimed invention be disclosed. It is not enough to say that appellants' invention and the reference are [\*985] both usable for instruction and both consist of permanent and removable printings on paper, as did the solicitor.

The dependent claims rejected with claim 28, as anticipated under § 102, are not anticipated since claim 28 is not anticipated. Some of them merely add features which are disclosed by the references and some do not. Insofar as they do not, they further negative anticipation. The examiner recognized this fact as to claims 33 and 34, which are limited to xerography, and therefore did not reject them under § 102. Similarly, he did not reject claim 30 on Reid or claims 35 and 36 on Bernstein. We find that claims 35 and 36 contain limitations which additionally distinguish from Reid. We

490 F.2d 981, \*, 1974 CCPA LEXIS 200, \*\*;  
180 U.S.P.Q. (BNA) 580

have already noted that Reid has no "response areas" as required by claim 28 and so Reid does not disclose the structure of claim 35 which additionally requires both the correct and incorrect answers to appear within the same response area.

As to claim 36, the examiner said it "is merely a printed matter variation of the design of the reference," Reid. This [\*\*12] is not a valid reason for rejection. Printed matter may very well constitute structural limitations upon which patentability can be predicated. We have commented on this matter in *In re Jones*, 54 CCPA 1218, 373 F.2d 1007, 153 USPQ 77 (1967); and *In re Miller*, 57 CCPA 809, 418 F.2d 1392, 164 USPQ 46 (1969), and will not repeat ourselves. The limitations of claim 36 are not remotely suggested by Reid.

There remains the § 103 rejection of claims 33 and 34. Do they, taken together with all of the limitations of claim 28 from which they depend, define obvious subject

matter? The difference between claim 28 and these two dependent claims is that they add the limitations to xerography. If Bernstein and Reid showed the claimed invention except for xerography, the addition of the Lein reference would make the subject matter of the claims obvious. But that is not the situation here. Adding the knowledge of xerographic technology to Bernstein or Reid still does not make the invention of claims 33 and 34 obvious for the same reasons we have given above in discussing anticipation. The essence of appellants' invention, as set forth in claim 28, is still missing notwithstanding the addition [\*\*13] of the Lein reference and we see nothing in the combinations of references which would have made the invention obvious to one of ordinary skill in the art at the time it was made. We will, therefore, reverse this rejection.

The decision of the board is reversed.

REVERSED

LEXSEE 424 F.2D 1382

In re David W. Wilson

No. 8271

United States Court of Customs and Patent Appeals

57 C.C.P.A. 1029; 424 F.2d 1382; 1970 CCPA LEXIS 378; 165 U.S.P.Q. (BNA)  
494

Oral argument February 4, 1970

May 7, 1970

**PRIOR HISTORY:** [\*\*\*1]

APPEALS from Patent Office, Serial No. 332,321

**DISPOSITION:**

Reversed.

**LexisNexis(R) Headnotes**

**COUNSEL:**

*Oberlin, Maky, Donnelly & Renner, William E. Thomson, Jr., John C. Oberlin*, attorneys of record, for appellant.

*Joseph Schimmel* for the Commissioner of Patents.  
*Raymond E. Martin*, of counsel.

**OPINIONBY:**

LANE

**OPINION:** [\*\*1382]

[\*1029] Before RICH, ALMOND, BALDWIN, LANE, Associate Judges, and FORD, Judge, sitting by designation.

LANE, Judge, delivered the opinion of the court.

This appeal is from the decision of the Patent Office Board of Appeals, which affirmed the rejection of claims 1-4, 8-10, and 15-21 in appellant's application serial No. 332,321, filed November 5, 1963, for "Treated Brush and Brush Treating Composition." Four other claims have been allowed. We conclude that the board's decision must be reversed.

**The Disclosure**

Appellant's disclosure discusses certain problems in the treatment of power-driven rotary brushes. According to the disclosure, it was desirable to produce [\*\*1383] a composition for treating the brush bristles, whereby the ability of the bristles to hold abrasive particles would be enhanced. It discloses that the treatment composition should have a [\*\*\*2] strength of adhesion to the brush bristles sufficiently great to prevent such composition from transferring excessively to the object being brushed; that the treatment material should wear at substantially the same rate as the brush bristles; that the material should have a high temperature softening point; and that the strength of adhesion between the treating composition and the abrasive particles must be sufficient to withstand the centrifugal force which normally would tend to throw the abrasive outwardly from the brush. The disclosure [\*1030] states that previously known brush-treating compositions did not accomplish all these objectives and

had a tendency to dry and lose their tackiness over a period of time, thus becoming useless for holding abrasive particles on the bristles.

The disclosure states that appellant discovered that a composition having a high temperature softening point and a high degree of tackiness could be produced if a film-forming resin were blended with a tackifier resin which was incompatible with (insoluble in) the film-forming resin. The resulting composition would have two distinct phases: a continuous phase comprised of film-forming resin, [\*\*\*3] either alone or saturated with a small quantity of tackifier resin, and a dispersed phase comprised of small particles of tackifier resin. The two resins may be either completely or partially incompatible, and the disclosure states that the more insoluble the resins, the greater the tack which the composition possesses. Appellant also disclosed that certain plasticizer could be added to render the resins more incompatible, thus further increasing the tack of the composition. Finally, appellant stated that the entire composition could be dissolved in a volatile solvent to allow easy application to the brush, the solvent being one which quickly evaporates upon such application.

The specification contains a list of suitable film-forming resins, including ethyl cellulose, nitro cellulose, cellulose acetate, polyvinyl acetate and cis-polyisoprene, among other materials. A list of tackifiers is given, including certain esters of abietic acid, polyvinyl ethyl ether, coumarone indene resin and terpene resins. A list of plasticizers is also given. The specification then gives four examples showing how to combine various film-formers, tackifiers, plasticizers and solvents to obtain [\*\*\*4] brush-treating compositions of the desired characteristics, and explains how to apply them to brushes.

#### The Claims

In view of the result we reach, we find that claims 1 and 8 are representative:

1. A two-phase brush treating composition having a high softening point and sufficient tack to retain abrasive material firmly adhered to brush fill material comprising a film-forming resin and a tackifier resin which is incompatible with said film-forming resin, said two phases comprising a continuous phase formed of said film-forming resin and a dispersed phase formed of small particles of tackifier resin.

8. In combination, a rotary brush having brush fill material and a two-phase pressure sensitive adhesive brush treating composition adhered thereto having a high softening point and sufficient tack to retain abrasive material firmly adhered to such brush fill material comprising a film-forming resin and a tackifier resin

which is incompatible with said film-forming resin, said two phases [\*1031] comprising a continuous phase formed of said film-forming resin and a dispersed phase formed of small particles of tackifier resin. [\*\*1384]

The remaining claims on appeal [\*\*\*5] are narrower, containing recitations of specific resins, plasticizers, etc.

#### The Prior Art

Grantham n1 relates to coatings for film material and discloses a coating composition comprising a cellulose derivative film-former, a blending resin, a plasticizer, and an organic solvent. Grantham teaches that the blending agent and the film-former should be compatible.

n1 U.S. Pat. 3,051,670, issued August 28, 1962.

Depew n2 teaches the preparation of emulsions consisting of a continuous phase of water and a discontinuous phase of elastomer particles and particles of a volatile hydrocarbon, with vulcanizing ingredients and other additives dispersed in the hydrocarbon particles. Depew then states that where a dispersion with additional adhesive properties is desired, an adhesive, such as certain of the tackifier resins disclosed by appellants, can be added to the emulsion, and that

n2 U.S. Pat. 2,933,469, issued April 19, 1960.

[this] adhesive can be water soluble or dispersed as particles. \* \* \* The chemistry of the adhesive component is not critical to this invention. The important thing is that the deposited film shall be tacky and adhesive.

Sergi n3 relates [\*\*\*6] to adhesives suitable for installation of floor-covering products such as linoleum. Sergi's composition consists of a tackifier resin dispersed in a latex binder; the tackifier and latex must be compatible with one another, according to the Sergi disclosure.

n3 U.S. Pat. 3,015,638, issued January 2, 1962.

Vaughan n4 teaches impregnating a fibrous buffing wheel with an aqueous emulsion consisting of a tacky resin and an emulsifier or stabilizer such as glue or gum.

n4 U.S. Pat 2,890,136, issued June 9, 1959.

The Board

The board found the composition claims to be unpatentable over Depew, Sergi or Grantham under 35 U.S.C. 103. The board reached this conclusion after noting that each of the three references shows some of the film-formers, tackifiers, plasticizers and solvents appearing in appellant's lists. The board found that the recited limitation of incompatibility was too relative a term to distinguish over the composition of the references.

The board found that the claims to the treated brush were unpatentable, under 35 U.S.C. 103, over Vaughan in view of Sergi or Depew. Since Vaughan shows treating brushes, the board apparently considered [\*1032] [\*\*\*7] it obvious to treat brushes with composition which it thought were made obviously by Sergi or Depew.

The Board also affirmed the rejection of certain claims for being "broader than the disclosure" under 35 U.S.C. 112. The board's basis for this rejection was that the specification did not provide adequate guidelines for making a selection among the various disclosed ingredients, nor among other materials which are not disclosed but would be included by the claims.

#### Opinion

We first treat the rejection under section 112. This rejection is in effect an attack on the specification as being insufficient to teach how to practice the broad invention claimed. The rejection is therefore under the first paragraph of section 112. The board's position, as mentioned above, was that the specification did not teach how to select ingredients so that the desired incompatibility would result. We disagree with the board's position on this point. First of all, appellant provided four examples, each specifying the nature and amounts of materials to be used. Secondly, the record indicates that it involves only routine experimentation to find out which resins are incompatible. The examiner admitted [\*\*\*8] as much when, [\*\*1385] with regard to obviousness, he said "selecting the proper tackifier and film-forming resin from those listed in the references to form an emulsion or two-phase composition would be within the expected skill of the art and would merely involve routine experimentation." We conclude that appellant has provided a sufficient specification to support the claims here in issue.

[1] Turning to the rejection of the claims for obviousness, we again disagree with the board's position. The board has disregarded the term "incompatible," and used in the claims, because it is "too relative" to distinguish over the compositions of the references. Appellant contends this limitation is essential in defining his invention. There has been no rejection here for indefiniteness, under the second paragraph of section 112. Rather than reject the claims as indefinite, the board chose to ignore the language it considered indefinite, and proceeded as though that language were not in the claims. The board said, in effect, that since we do not know what "incompatible" means, and the rest of the claim defines obvious subject matter, there is no basis for concluding unobviousness. [\*\*\*9] This reasoning is incorrect. All words in a claim must be considered in judging the patentability of that claim against the prior art. If no reasonably definite meaning can be ascribed to certain terms in the claim, the subject matter does not become obvious - the claim becomes indefinite. In the present case, we think the [\*1033] term "incompatible" is defined with reasonable definiteness in the specification. While it is true that the word is not perfectly precise, under the circumstances of the present case there appears to be no other way for appellant to describe his discovery. In any event, the ignoring of this term by the board renders its conclusion of obviousness unsupported. None of the references discloses a two-phase composition of incompatible resins or suggests that such a composition would have the properties disclosed by appellant. Grantham and Sergi both expressly teach that the components of their compositions should be compatible. Neither Vaughan nor Depew uses a resin as the continuous phase. While Depew states, as quoted above, that the adhesive material may be dispersed as particles in the continuous phase, and hence be incompatible with the continuous [\*\*\*10] phase material, it cannot be ignored that Depew's continuous phase is of water, not a film-forming resin as recited in appellant's claims. Furthermore, there is no suggestion in Depew or Vaughan that there are advantages in using an adhesive which is insoluble in the aqueous phase. There is nothing of record, therefore, from which we can properly conclude that the subject matter of appellant's claims would have been obvious at the time of his invention. The decision of the board must accordingly be reversed.